

MONTHLY WEATHER REVIEW.

ANNUAL SUMMARY FOR 1893.

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INTRODUCTION.

This annual summary for 1893 is based upon data received from co-operating weather services, and from 1,573 stations occupied by regular and voluntary observers of the Weather Bureau. The statistical data have been prepared by the

Division of Records and Meteorological Data, A. J. Henry, Acting Chief; the text and editorial work by Prof. Cleveland Abbe.

The title page and contents of the REVIEW for 1893 are also published herewith.

GENERAL CLIMATIC CONDITIONS.

CHARTS.

Chart I.—The normal annual pressure as given by the mercurial barometer, reduced to sea level by Prof. H. A. Hazen's tables, but not to standard gravity. The latter reduction, so far as it refers to the variation of gravity with latitude only, can easily be made by using the numerical values given for each degree of latitude on the right-hand side of the chart. The normal pressures are generally for a 20-year period; the resultant wind directions for a 15-year period.

Chart II.—The annual mean pressure for 1893 as given by the mercurial barometer, reduced to sea level but not to standard gravity. The resultant wind directions, as given in Table IV, are shown here by arrows.

Chart III.—The annual mean temperature of the air near the surface of the ground is shown by full lines, and the departures from the normal by broken lines; the lines thus drawn are intended to show the surface or climatological conditions under which animal and vegetable life exist, but for other studies it is more convenient to have isotherms drawn for an ideal sea-level temperature just as for the pressure of the air; the necessary reduction to sea level requires the assumption of a rate of diminution of temperature with altitude for the free atmosphere above the surface of the earth. Such a rate may be determined from observations, and is implied in the reduction of the barometer to sea level, but can not be applied to the hypothetical atmosphere below the surface of the earth, except with the understanding that it is purely a conventional arrangement adopted for the purposes of cartography; for this purpose the rate of one-half of a degree centigrade per 100 meters, or its equivalent, 0.274° F. per 100 feet, has been adopted in accordance with the general practice of climatologists; the isotherms thus prepared, and shown by dotted lines, can, therefore, be directly compared with those published by others, especially Hann.

Chart IV.—The maximum temperature of the year, as reported at regular stations of the Weather Bureau and without further reductions.

Chart V.—The minimum temperature of the year as reported.

Chart VI.—The absolute ranges of temperature.

Chart VII.—The total annual precipitation.

The following corrections to the statistical data in the quarto volume for 1891-'92 have been attended to in preparing the charts of normal values:

Page 14, for Southport, "latitude 38.35," read "33.55."

Page 440, for the "normal pressures at Parkersburg, W. Va., and Portland, Oreg.," substitute the following:

PARKERSBURG, W. VA.

Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
29.44 30.15	29.42 30.13	29.36 30.07	29.39 30.08	29.33 30.01	29.34 30.01	29.38 30.05	29.39 30.06	29.44 30.12	29.39 30.09	29.45 30.16	29.48 30.19	29.40 30.09

PORTLAND OREG.

Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
29.91 30.09	29.90 30.08	29.86 30.04	29.87 30.05	29.86 30.03	29.86 30.03	29.87 30.04	29.85 30.02	29.85 30.02	29.89 30.07	29.92 30.10	29.89 30.07	29.88 30.05

THE NORMAL ANNUAL BAROMETRIC PRESSURE.

The normal annual barometric pressure by mercurial barometer, not reduced to standard gravity, is about 30.02 at the southern boundary of the United States, viz, San Diego, Cal., and Corpus Christi, Tex., and increases to 30.09 as we go northward to Oregon, or 30.07 in Missouri, after which it diminishes as we go further northward to 30.03 at the northern limit of Washington and Minnesota. This diminution continues into Alaska and the Canadian Dominion; it also diminishes as we go eastward from Minnesota to New Brunswick and Nova Scotia, where it averages about 29.95. But as we go eastward from Texas the annual mean pressure rises until it becomes about 30.11 on the south Atlantic coast, which is the region of the maximum annual pressure for any portion of the United States. The regions of low pressure in the Northern Hemisphere are central in the North Pacific along the Aleutian Archipelago and in the North Atlantic between Iceland and southern Greenland; the region of highest pressure extends from the south Atlantic States eastward along the thirtieth parallel to the coast of Africa. A depression extends from Yuma, Ariz., southeast over the Gulf of California and the adjacent coast of Mexico, which is to be considered as a northward extension of what is called the tropical belt of low pressure. In the summer months this extends northward to the British possessions, while the whole belt moves northward; in the winter time the entire belt moves southward, and Mexico, like the United States, has a higher average pressure.

During 1893 the distribution of pressure has been such as to be below the normal by from .02 to .05 in the southwest, the interior valleys, and the upper Lake region, but above the normal by .02 or .03 in the extreme northeast and at several Pacific coast stations.